Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters	)	IB Docket No. 16-408
	)	
	)	

To: The Commission

REPLY COMMENTS OF
THE BOEING COMPANY

The Boeing Company ("Boeing") applauds Governor Bill Walker for prioritizing the identification of "solutions to the broadband gap that exists between the urban and rural parts of Alaska" and for recognizing that unique ability of non-geostationary satellite orbit ("NGSO") satellite systems "to close the broadband gap by bringing affordable, high-speed broadband Internet access to our entire state."[1]

As the Governor highlights, "[b]roadband access is essential to driving growth in local economies as well as providing educational, medical, and emergency response services."[2] Terrestrial-based broadband technologies cannot provide these critically needed services because "geographic isolation and environmental protection challenges make rural Alaska's middle mile infrastructure cost prohibitive."[3]

---

[1] *See* Letter from Bill Walker, Governor, State of Alaska, to Marlene H. Dortch, Secretary, Federal Communications Commission, at 1 (Dec 20, 2017) ("*2017 Governor Walker Letter*").

[2] *Id.*

[3] *See* Letter from Bill Walker, Governor, State of Alaska, to The Honorable Tom Wheeler, Chairman, Federal Communications Commission, at 1 (Aug. 3, 2016) ("*2016 Governor Walker Letter*").

In contrast, NGSO satellite systems are optimal for serving the broadband needs of rural and remote communities. As the Governor observes, NGSO satellite systems "eliminate[] the need to construct middle mile connections" and can "move data directly from homes, businesses, schools, hospitals, vessels, or aircraft via satellite to high-speed broadband internet gateways in larger urban areas."[4]

Although Boeing fully concurs with Governor Walker regarding the substantial public interest benefits that NGSO satellite systems can provide in closing the digital divide, Boeing respectfully disagrees with the Governor's assessment that NGSO satellite system operators lack any commercial incentive to bring broadband services to his state.[5]

One of the primary business cases for NGSO satellite systems is the provision of broadband services to very rural and remote locations where terrestrial services are unavailable. Further, the underlying orbital mechanics of NGSO satellite systems dictate their global coverage capabilities. Thus, as the Governor has recognized, any NGSO system operator that employs a polar or near-polar orbit constellation will, by design, provide "tremendous coverage" to such high latitude locations as "Alaska and other Artic regions."[6] The NGSO constellation designs proposed by OneWeb (polar orbit), Telesat Canada (polar orbit), Leosat (polar orbit), Kepler Communications (polar orbit), Theia Satellite Network (near polar orbit) and Space Norway (highly elliptical orbit) would each provide tremendous coverage of Alaska and the rest of the Artic regardless of whether the domestic geographic coverage requirements are retained.

---

[4] *2016 Governor Walker Letter* at 1.

[5] *See 2017 Governor Walker Letter* at 1 (concluding that "[t]he incentive for generalized non-geostationary, fixed-satellite service systems to provide service to all of Alaska in addition to the contiguous states disappears with the removal of the domestic coverage requirement").

[6] *2016 Governor Walker Letter* at 1.

The strong economic incentives for NGSO system operators to serve rural and remote areas can be documented by examining the geographic coverage strategies of operators of geostationary satellite orbit ("GSO") fixed-satellite service ("FSS") networks. The Commission has never imposed geographic coverage requirements on GSO FSS network licensees.[7] Nevertheless, every major GSO FSS system operator serving the United States maintains multiple satellites that provide coverage of Hawaii, Puerto Rico, the U.S. Virgin Islands and most of Alaska. For this reason, Boeing is at a loss to understand the claim of WorldVu, Hughes and Intelsat that "[i]f the Commission eliminates the domestic coverage requirement, the incentive to serve these rural and underserved areas will be lost."[8] Both Hughes and Intelsat operate GSO FSS satellites that provide substantial coverage of such rural and underserved areas as Alaska. Therefore, sufficient economic incentive must exist to do so.

Boeing is also perplexed by the suggestion of WorldVu, Hughes and Intelsat that the Commission should retain its domestic geographic coverage requirements and grant exceptions through "case-by-case" waiver proceedings.[9] The three operators suggest that such waivers should be granted only to "specialized satellite networks" serving niche markets, citing Space Norway and O3b as examples.[10] O3b, however, is serving a very wide range of customer

[7] The Commission maintains geographic coverage rules for licensees in the mobile-satellite service (§ 25.143), the direct broadcast satellite service (§ 25.148(c)), the broadcast satellite service (§ 25.225) and for NGSO FSS systems, but not for GSO FSS systems.

[8] Comments of WorldVu Satellites Limited, Hughes Network Systems, LLC, and Intelsat Corporation, IB Docket No. 16-408, at 4-5 (Jan. 2, 2018) ("*Opposing Satellite Operators Comments*").

[9] *Id.* at 5-6.

[10] *See id.* at 5.

segments, albeit only at latitudes below 55 degrees.[11] Space Norway, in contrast, is proposing the use of a highly elliptical NGSO satellite system to serve Artic regions (including Alaska) above 55 degrees latitude,[12] the very region that WorldVu, Hughes and Intelsat claim NGSO satellite system operators have no incentive to serve.

WorldVu, Hughes and Intelsat then assert that geographic coverage waivers should not be granted to operators of very large NGSO systems comprised of thousands of satellites.[13] The three operators, however, provide no guidance regarding the line drawing that would be necessary to determine just how many satellites would be too many to merit a waiver. Further, such a waiver review process would invariably devolve into an adversarial and protracted examination of each NGSO system operator's business plans and the relative merits of its coverage strategies.

The far better and more efficient approach is for the Commission to recognize (as it apparently already has) that its domestic geographic coverage rule addresses a problem that does not exist. Multiple companies have proposed the launch of NGSO satellite systems that are designed to serve the most rural and remote regions of the United States, including to every point in Alaska. The orbital architectures for these systems – be they polar, near-polar, or highly

---

[11] *See* O3b Limited**,** Application to Operate a Gateway Earth Station with a Non-U.S. Licensed Non-Geostationary Orbit Ka-band Space Station System, U.S. Market Access Application, FCC File No. SES-LIC-20100723-00952, Attachment A (Technical Information to Supplement Schedule S) at 13 (July 23, 2010) (explaining that, as a result of its constellation design "[a]t 55° latitude the elevation is less than 10°, even for the sub-satellite longitude, and so service performance, although possible, would be reduced significantly in terms of achievable data rates and link availability due to blockage and particularly rain attenuation problems cause by the low elevation angle and high operating frequency").

[12] *See* Space Norway AS, Petition for a Declaratory Ruling Granting Access to the U.S. Market for the Arctic Satellite Broadband Mission, *Order and Declaratory Ruling*, FCC 17-146, ¶ 20 (Nov. 3, 2017).

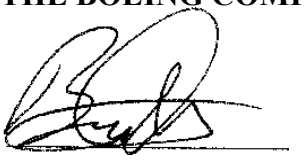
[13] *See Opposing Satellite Operator Comments* at 6.

elliptical – will provide extensive coverage of Alaska and other remote areas regardless of whether the geographic coverage requirements are maintained. Therefore, WorldVu, Hughes and Intelsat lack any basis to claim that, in the absence of domestic geographic coverage rule, some NGSO system operators might provide service "only to urban populations."[14]

Satellites – both in GSO and NGSO orbits – have long been recognized for their unique ability to provide comprehensive coverage to customers in all locations regardless of the geographic conditions of the area being served. The multiple proposals for NGSO satellite systems that are pending before the Commission uniformly recognize this distinctive business opportunity, each proposing somewhat different strategies to help bridge the global digital divide in broadband services. The Commission's domestic geographic coverage rule is therefore not only unnecessary, but inadvertently restricts the flexibility of NGSO system proponents and, as a result, may impede the launch of highly beneficial global satellite systems. Therefore, the Commission is correct in proposing the elimination of this unnecessary requirement.

Respectfully submitted,

THE BOEING COMPANY

By: 

Audrey L. Allison
Senior Director, Frequency Management Services
The Boeing Company
929 Long Bridge Drive
Arlington, VA 22202
(703) 465-3215

Bruce A. Olcott
Jones Day
51 Louisiana Ave. NW
Washington, D.C. 20001
(202) 879-3630

Its Attorneys

January 29, 2018

[14] *Id.* at 6.